DX6400

QUICK REFERENCE GUIDE

NOTE

This manual illustrates Local Lonworks network applications. For other types of installations, such as ID-NET™, Pass-Through, Multiplexer Layout, etc., refer to the DX6400 Reference Manual available on the CD. For complete scanner configuration using the Genius™ configuration program refer to the Help On Line.

821001215 (Rev. F)

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DX6400 GENERAL VIEW

Figure A

1 Laser Beam Output Windows 2 Laser Safety Label

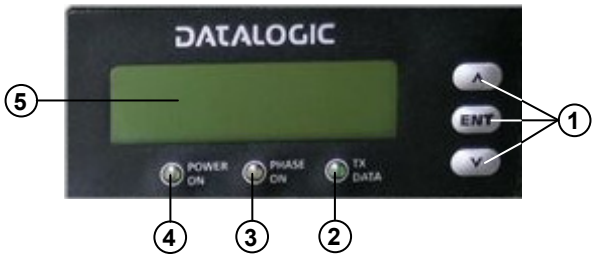
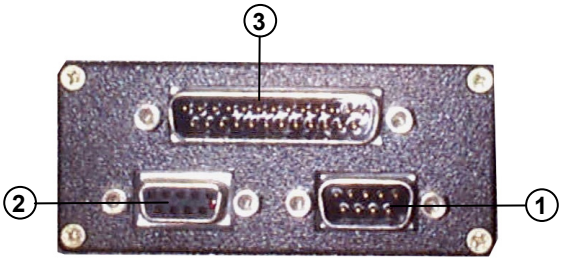
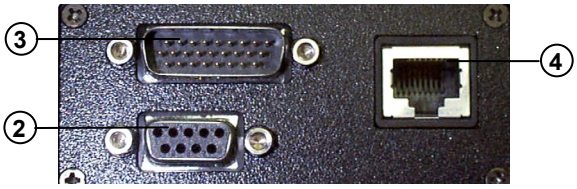


Figure B

1 Programming Keypad
2 TX Data LED (Green)
3 Phase On LED (Yellow)
4 Power On LED (Red)
5 LCD Display



Standard



Ethernet

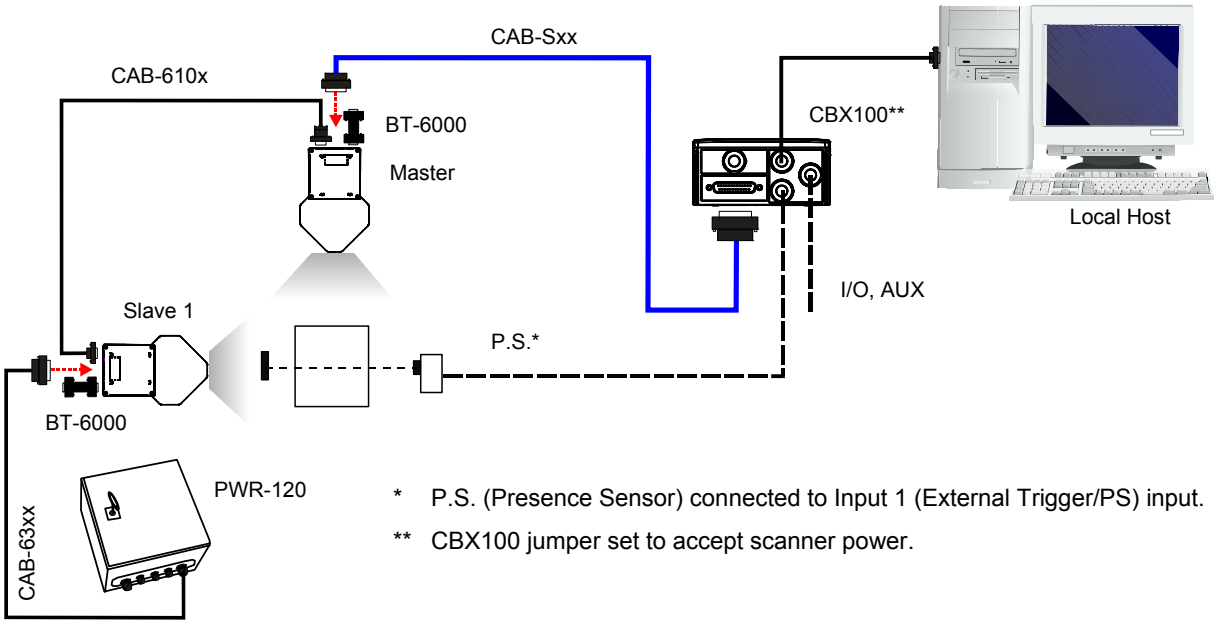
Figure C

1 Lonworks 9-pin Male Connector
2 Lonworks 9-pin Female Connector
3 Serial Interface and I/O 25-pin (26-pin) male Connector
4 RJ45 Modular Connector for Ethernet Interface

CONNECTIVITY

Examples of the most common system layouts are shown in this section, for additional layouts refer to the Reference Manual.

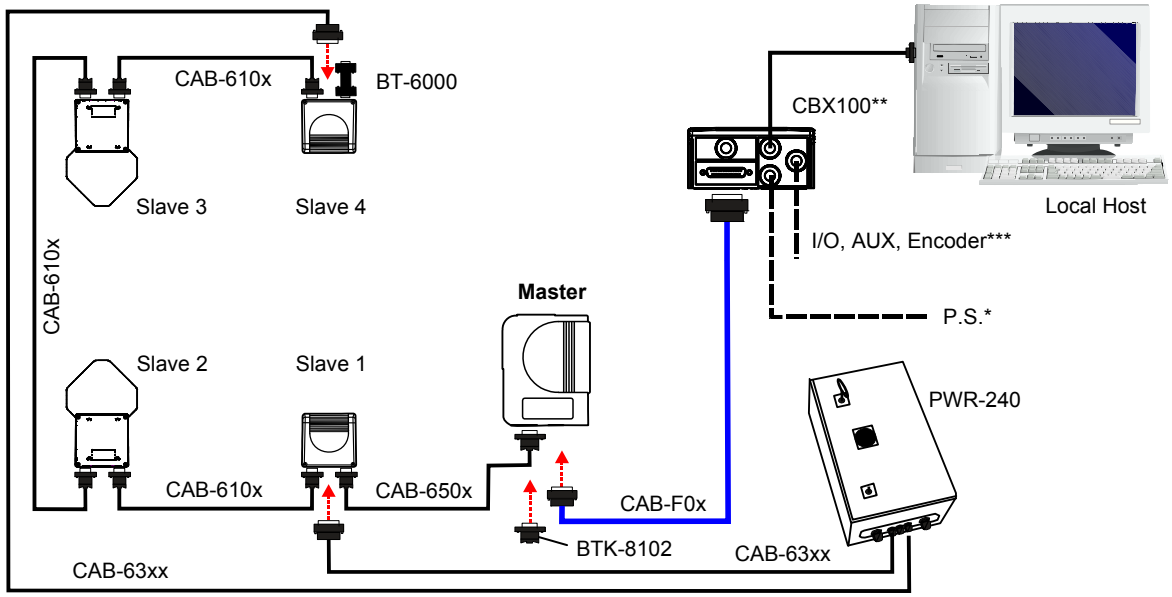
Local Lonworks Networks



* P.S. (Presence Sensor) connected to Input 1 (External Trigger/PS) input.

** CBX100 jumper set to accept scanner power.

Small Synchronized Network with 2 Readers



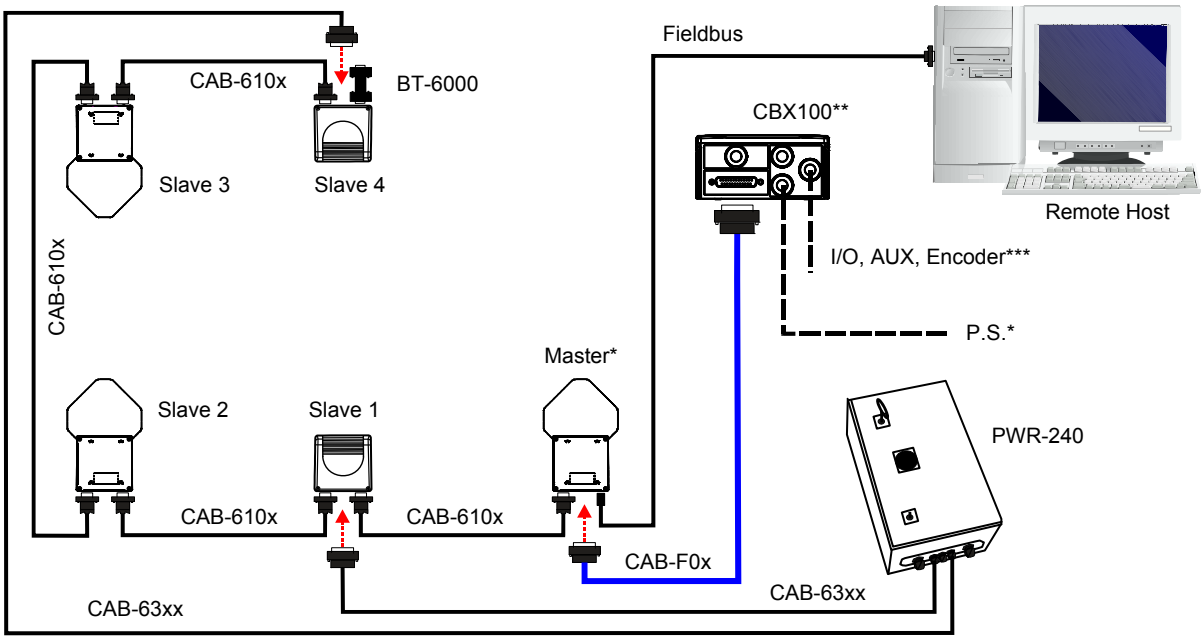
Note: In a mixed 8K and 6K family scanner network, only the 8K family scanner can be Master

* P.S. (Presence Sensor) connected to Input 1 (External Trigger/PS) input.

** CBX100 jumper set to accept scanner power.

*** Encoder connected to Input 2 (Encoder) input.

Synchronized Network with DS8100A Master and 6K Family Slaves - Serial Host

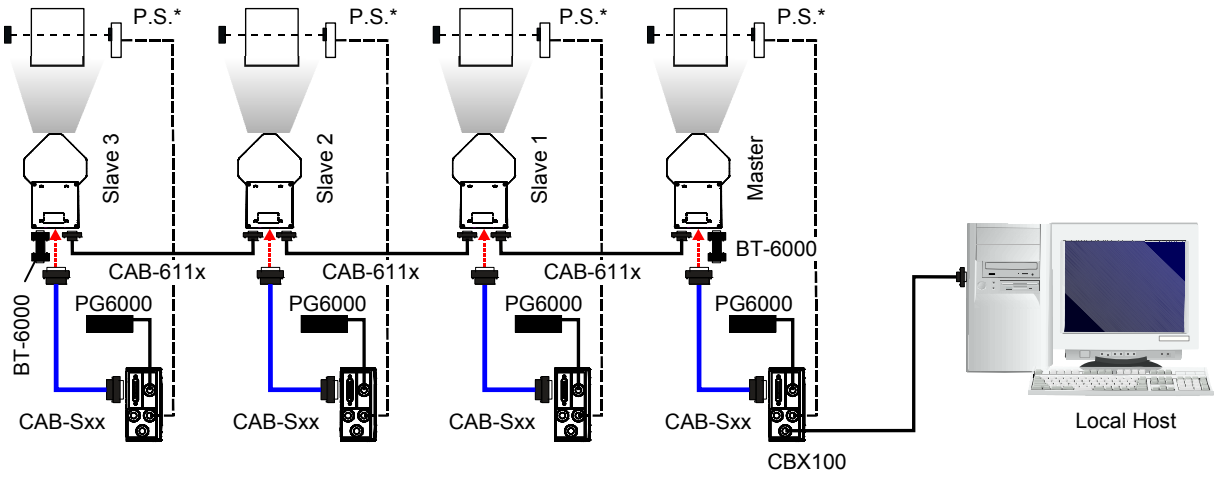


* P.S. (Presence Sensor) connected to Input 1 (External Trigger/PS) input.

** CBX100 jumper set to accept scanner power.

*** Encoder connected to Input 2 (Encoder) input.

Synchronized Network with DX6400 Master and 6K Family Slaves - Fieldbus Host



* Each P.S. (Presence Sensor) connected to Input 1 (External Trigger/PS) input.

Multidata Network

NETWORK TERMINATION

When building a local Lonworks system the network must be properly terminated by positioning a BT-6000 terminator on the DX6400 master reader (BT-6000 female side) and on the last slave reader (BT-6000 male side).

BT-6000 Network Terminator

ELECTRICAL CONNECTIONS

The details of the connector pins are indicated in the following tables:

The table below gives the pinout of the CBX100/CBX500 terminal block connectors. Use this pinout when the DX6400 reader is connected by means of the CBX100/CBX500:

CBX100/500 Terminal Block Connectors			
Power			
Vdc	Power Supply Input Voltage +		
GND	Power Supply Input Voltage -		
Earth	Protection Earth Ground		
Inputs			
+V	Power Source – Inputs		
-V	Power Reference – Inputs		
I1A	EXT TRIG/PS A (polarity insensitive) for PS		
I1B	EXT TRIG/PS B (polarity insensitive) for PS		
I2A	IN 2/ENC A (polarity insensitive) for Encoder		
I2B	IN 2/ENC B (polarity insensitive) for Encoder		
I3A	IN 3A (polarity insensitive) (only with CBX500)		
I4A	IN 4A (polarity insensitive) (only with CBX500)		
I34B	IN 3B/IN 4B Reference (polarity insensitive) (only with CBX500)		
Outputs			
+V	Power Source - Outputs		
-V	Power Reference - Outputs		
O1+	OUT 1+		
O1-	OUT 1-		
O2+	OUT 2+		
O2-	OUT 2-		
O3A	OUT 3A (polarity insensitive) (only with CBX500)		
O3B	OUT 3B (polarity insensitive) (only with CBX500)		
Auxiliary Interface			
TX	Auxiliary Interface TX		
RX	Auxiliary Interface RX		
SGND	Auxiliary Interface Reference		
Shield			
Shield	Network Cable Shield		
Main Interface			
	RS232	**RS485 Full-Duplex**	**RS485 Half-Duplex**
	TX	TX+	RTX+
	RTS	TX-	RTX-
	RX	*RX+	
	CTS	*RX-	
	SGND	SGND	SGND

* Do not leave floating, see Reference Manual for connection details.

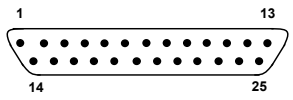
CAUTION

Do not connect GND and SGND to different (external) ground references. GND and SGND are internally connected through filtering circuitry which can be permanently damaged if subjected to voltage drops over 0.8 Vdc.

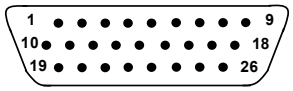
The DX6400 scanner provides a 25-pin (26-pin for Ethernet models) male D-sub connector for connection to power supply, Host interface (Main and Aux), and input/output signals.

25-pin / 26-pin D-Sub Connector Pinout

Pin	Name	Function
1	CHASSIS	Chassis - internally connected to GND Cable shield connected to chassis
20	RXAUX	Receive data of auxiliary RS232 (referred to GND)
21	TXAUX	Transmit data of auxiliary RS232 (referred to GND)
8	OUT 1+	Configurable digital output 1 – positive pin
22	OUT 1-	Configurable digital output 1 – negative pin
11	OUT 2+	Configurable digital output 2 – positive pin
12	OUT 2-	Configurable digital output 2 – negative pin
16	OUT 3A	Configurable digital output 3 – polarity insensitive
17	OUT 3B	Configurable digital output 3 – polarity insensitive
18	EXT_TRIG/PS A	External trigger (polarity insensitive) for PS
19	EXT_TRIG/PS B	External trigger (polarity insensitive) for PS
6	IN2/ENC A	Input signal 2 (polarity insensitive) for Encoder
10	IN2/ENC B	Input signal 2 (polarity insensitive) for Encoder
14	IN3A	Input signal 3 (polarity insensitive)
15	IN4A	Input signal 4 (polarity insensitive)
24	IN_REF	Common reference of IN3 and IN4 (polarity insensitive)
9, 13	VS	Supply voltage – positive pin
23, 25, 26	GND	Supply voltage – negative pin



25-pin male D-sub Connector



26-pin male D-sub Connector

Main Interface

Pin	RS232	RS485 Full-Duplex	RS485 Half-Duplex
2	TX	TX485+	RTX485+
3	RX	* RX485+	
4	RTS	TX485-	RTX485-
5	CTS	* RX485-	
7	GND_ISO	GND_ISO	GND_ISO

* Do not leave floating, see Reference Manual for connection details.

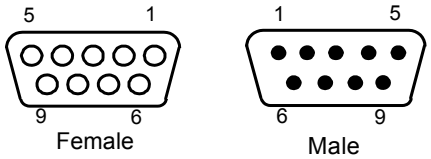
Two 9-pin connector(s) provide access to the scanner's local Lonworks network.

The Master/Slave model has two Lonworks connectors used for both input and output connections to build a multi-sided or omni-station system.

The Fieldbus model (Ethernet) has one Lonworks connector and therefore can be used in a Lonworks network only as a Master.

9-pin Lonworks Connector Pinout

Pin	Name	Function
1	CHASSIS	Cable shield internally connected by capacitor to chassis
9	VS	Supply voltage – positive pin
2	GND	Supply voltage – negative pin
6	VS_I/O	Supply voltage of I/O circuit
3	Ref_I/O	Reference voltage of I/O circuit
4	SYS_ENC_I/O	System signal
5	SYS_I/O	System signal
7	LON A	Lonworks line (polarity insensitive)
8	LON B	Lonworks line (polarity insensitive)

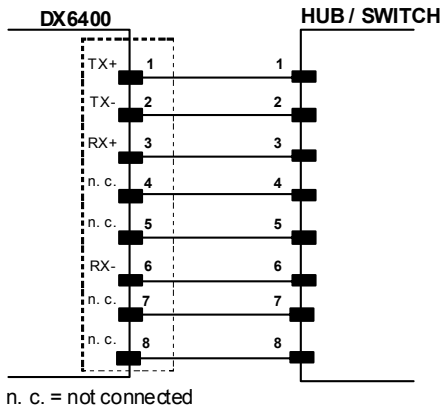


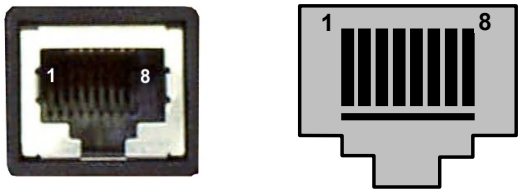
(M/S model only)

9-pin Local Lonworks Connectors

Ethernet Model

RJ45 Modular Connector





RJ45 Female Connector

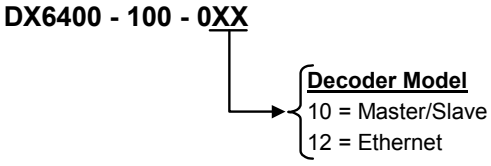
APPENDIX

TECHNICAL FEATURES

ELECTRICAL FEATURES		
Supply Voltage	15 to 30 Vdc	
Power Consumption	1.2 to 0.6 A; 18 W typical 1.5 to 0.7 A; 24 W Max. (including startup current)	
Common Communication Interfaces	**Main**	**Baud Rate**
	RS232	1200 to 115200
	RS485 full-duplex	
	RS485 half-duplex	
	Auxiliary	
	RS232	1200 to 115200
	Other	
	Lonworks	1.25 Mb/s
Model-Dependent Communication Interfaces	Ethernet	100 Mb/s
Inputs Ext. Trigger 1, Encoder 2 aux. digital inputs	(optocoupled NPN or PNP)	
Outputs 3 software programmable digital outputs	(optocoupled)	
OPTICAL FEATURES		
Light Receiver	Avalanche photodiode	
Wavelength	630 to 680 nm	
Safety Class	Class 2 - EN60825-1; Class II - CDRH	
Light Source	Up to 2 semiconductor laser diodes	
Laser Control	Security system to turn laser off in case of motor slow down	
READING FEATURES		
Scan rate	up to 1500 scans/s (750 per leg)	
Maximum Resolution Max. Reading Distance Max. Reading Width Max. Depth of Field	(see reading diagrams)	

USER INTERFACE		
LCD Display	2 lines by 16 characters LCD	
Keypad	3 keys	
LED Indicators	Power On (red) Phase On (yellow) TX Data (green)	
SOFTWARE FEATURES		
Readable Codes	Interleaved 2/5 Code 39 Standard Codabar Code 128 GS1-128 (ex EAN 128) Code 93 (standard and full ASCII) EAN/UPC (including Add-on 2 and Add-on 5) GS1 DataBar (including Limited and Expanded)	
Code Selection	Up to 10 codes during one reading phase	
Headers and Terminators	Up to 128-bytes headers and 128-bytes terminators	
Operating Modes	On Line, Serial On Line, Automatic, Test, PackTrack™, Continuous	
Configuration Modes	Genius™ utility program	
Parameter Storage	Non-volatile internal FLASH	
ENVIRONMENTAL FEATURES		
Operating Temperature	0° to +40 °C (+32° to +104 °F)	
Storage Temperature	-20° to +70 °C (-4° to +158 °F)	
Humidity	90% non condensing	
Ambient Light Immunity	10000 lux	
Vibration Resistance EN 60068-2-6 2 hours on each axis	14 mm @ 2 to 10 Hz; 1.5 mm @ 13 to 55 Hz; 2 g @ 70 to 200 Hz	
Shock Resistance EN 60068-2-27 3 shocks on each axis	30 g; 11 ms	
	Ethernet models	**Master/Slave models**
Protection Class – EN 60529	IP50	IP64
PHYSICAL FEATURES		
Mechanical Dimensions	225.9 x 149.8 x 116.8 mm (8.89 x 5.90 x 4.60 in)	
Weight	2.1 kg. (4.62 lbs)	

MODEL DESCRIPTION



ACCESSORIES

Name	Description	Part Number
Power Supplies		
PG6002	Single unit power supply (US)	93ACC1718
PG6001	Single unit power supply (UK)	93ACC1719
PG6000	Single unit power supply (EU)	93ACC1720
PWR-120	J-box power unit 110/230 VAC 24 V 120 W	93ACC1530
PWR-240	J-box power unit 110/230 VAC 24 V 240 W	93ACC1070
PWR-480A	J-box power unit 110/230 VAC 24 V 480 W	93ACC1850
Cables and Terminators		
BT-6000	Bus terminator	93A051299
CAB-6101	9-pin scanner/scanner connection cable 1 m	93A051220
CAB-6102	9-pin scanner/scanner connection cable 2 m	93A051230
CAB-6105	9-pin scanner/scanner connection cable 5 m	93A051240
CAB-6112	9-pin scanner to scanner no power cable 2 m	93A051224
CAB-6115	9-pin scanner to scanner no power cable 5 m	93A051225
CAB-6305	25-pin power cable Fam 6k 5 m	93ACC1768
CAB-6310	25-pin power cable Fam 6k 10 m	93ACC1752
CAB-S01	STD cable to CBX 1 m (25-pin to 25-pin)	93A051351
CAB-S02	STD cable to CBX 2 m (25-pin to 25-pin)	93A051352
CAB-S05	STD cable to CBX 5 m (25-pin to 25-pin)	93A051353
CAB-S10	STD cable to CBX 10 m (25-pin to 25-pin)	93A051354
CAB-F01	6K-8K FBUS cable to CBX 1 m (26-pin to 25-pin)	93A051355
CAB-F02	6K-8K FBUS cable to CBX 2 m (26-pin to 25-pin)	93A051356
CAB-F05	6K-8K FBUS cable to CBX 5 m (26-pin to 25-pin)	93A051357
CAB-6502	Fam 6K-8K cross cable 2.5 m (9-pin to 17-pin)	93A051288
CAB-6505	Fam 6K-8K cross cable 5 m (9-pin to 17-pin)	93A051289
Software Management		
Datalogic WebSentinel-005	Supervisor (up to 5 arrays)	93A101014
Datalogic WebSentinel-010	Supervisor (up to 10 arrays)	93A101015
Datalogic WebSentinel-020	Supervisor (up to 20 arrays)	93A101016
Datalogic WebSentinel-032	Supervisor (up to 32 arrays)	93A101017
Datalogic WebSentinel-064	Supervisor (up to 64 arrays)	93A101018
Datalogic WebSentinel-128	Supervisor (up to 128 arrays)	93A101019
Datalogic WebSentinel-256	Supervisor (up to 256 arrays)	93A101020
*** Connection Boxes**		
CBX100	Compact Connection Box	93A301067
CBX500	Modular Connection Box	93A301068
CBX800	Gateway Connection Box	93A301077
BM100	Backup Module	93ACC1808
BA100	DIN Rail Adapters for CBX	93ACC1821
BA200	Bosch Adapters for CBX	93ACC1822
BA900	Two Cable Glands Panel	93ACC1847
Sensors		
MEP-593	Photocell kit – PNP (PH-1)	93ACC1791
MEP-543	Photocell kit – NPN	93ACC1728
OEK-2	Optical encoder kit (10 m cable + spring)	93ACC1770
OEK-1	Optical encoder kit + 10 m cable	93ACC1600
Miscellaneous		
FBK-6000	Fast bracket kit (2 pcs)	93ACC1721

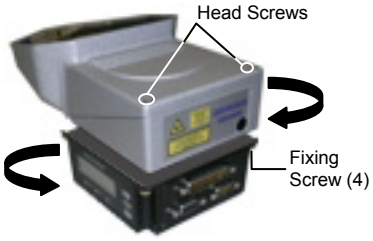
* DX6400 application software does not support any of the CBX500 Host Interface Module accessories nor the BM150 Display accessory. Use the CBX800 Gateway for Host Interface Applications, (Fieldbus and non Fieldbus).

MECHANICAL INSTALLATION

The DX6400 reader can be positioned and installed in the best way possible as a result of the patented Step-A-Head™ feature. Thanks to the separation between Head and Base, you can modify the orientation of the decoder base, and therefore display-keypad and connector panels, while keeping the optic head in the correct reading position. The reading head and the decoder base can be rotated independently from each other allowing the installation even in the most critical locations.

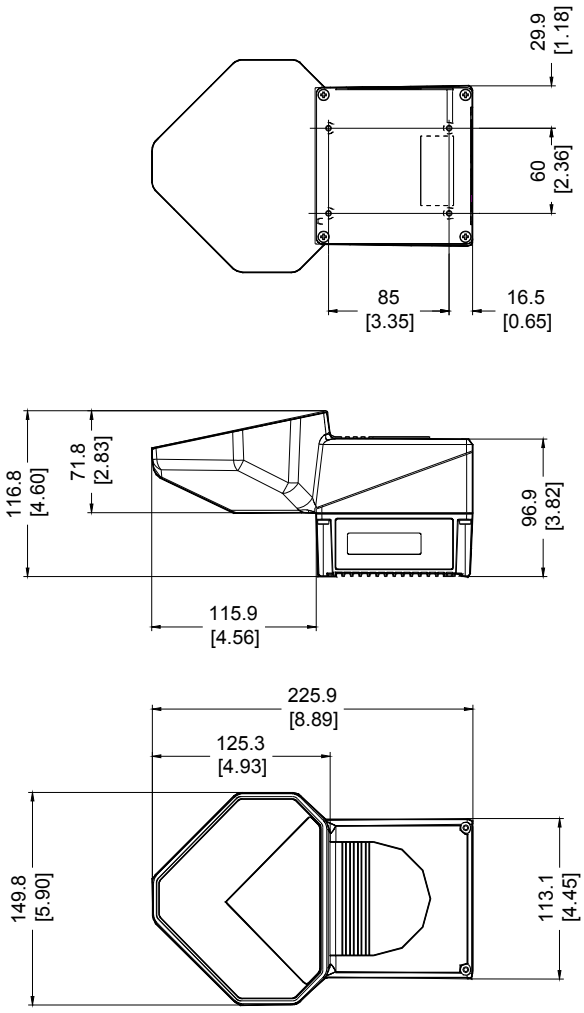
To rotate the head follow the given procedure:

1. detach the head from the base by unscrewing the four fixing screws;
2. rotate the head in the desired position;
3. loosen but don't remove the two screws on top of the head;
4. affix the head onto the base carefully aligning the four fixing screws and progressively tightening them about half-way;
5. completely tighten the two screws on top of the head;
6. completely tighten the four fixing screws.

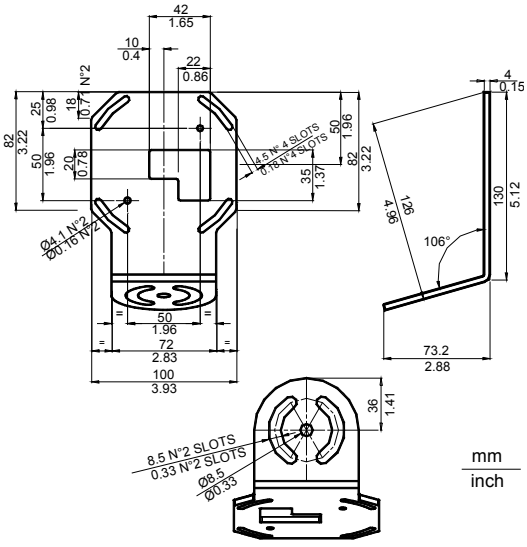


Step-A-Head™ Feature

The following diagrams give the overall dimensions of the reader and mounting bracket. They may be used for their installation:

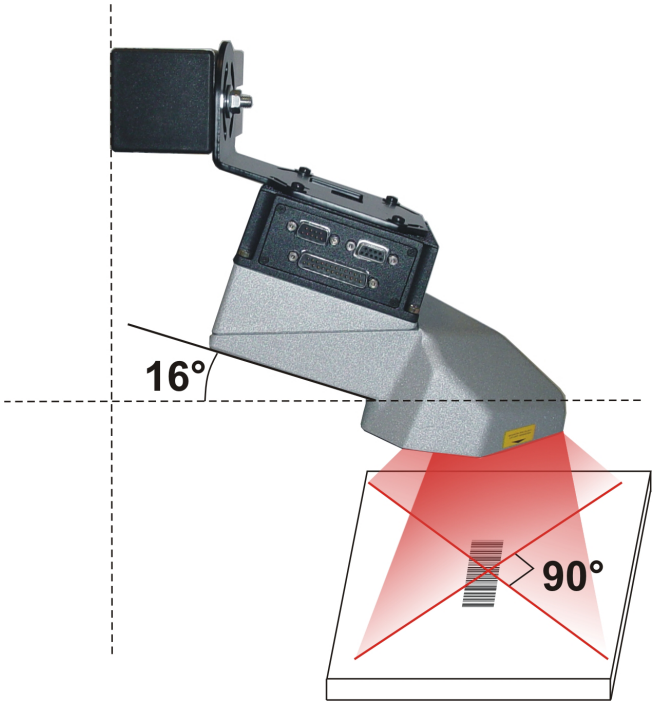


DX6400 Overall Dimensions



ST-237 Mounting Bracket Overall Dimensions

Mount the scanner using the ST-237 mounting bracket which assures an angle of 16°, as indicated in the figure below, in order to obtain an angle of 90° between the two scan lines. This guarantees an omni directional reading of the barcode, if the code label satisfies the ACR™ 4 conditions (see Scanner Reference Manual for details).



DX6400 Mounting Position

WARNING

When installing several scanners, take care to position them correctly so that no laser beam enters the reading window perpendicularly and at the same level of the output beam of the other scanners. This condition could occur more frequently for side mounted applications. If these precautions are not followed, it may occur that the laser of the blinded scanner starts blinking due to an internal circuit which temporarily turns the laser off when detecting a power anomaly. To resolve this problem, it is sufficient to slightly change the inclination and position of one of the two scanners involved.

FLASH™ DYNAMIC FOCUS

The DX6400 has an innovative linear motor designed to control the focus position of the scanner via software. This dynamic system, called FLASH™, is able to move the focus position rail to rail, from the minimum position to the maximum position.

The FLASH™ functionalities (i.e. the driving modes of the linear motor) are programmed via the Genius™ software tool and can operate in the following modes:

- Fixed mode: the focus is set to the desired position via software (expressed in cm);
- Continuous mode: the focus position is continuously running from a minimum position to a maximum position with a defined frequency;
- Triggered mode: the focus position can be set depending on the received external input (photocell, barrier, serial message, etc.);
- D-Flash™ mode: the focus position can be set depending on the measured distance between the scanner and the scanned object. This is the most innovative and flexible function that makes different software implementations possible. The D-Flash™ development has been based on the minimum distance detected. Thus, it can apply to the widest variety of applications. Further developments of D-Flash™ will be provided according to the specific application needs.

READING CONDITIONS

- ANSI Grade B minimum
- 600 scans/sec per leg

The following tables describe the requirements for standard applications.

Minimum Code Height for Omnidirectional Reading (mm)							
Conveyor Speed (m/s)		**0.5**	**1**	**1.5**	**2**	**2.5**	**3**
2/5 Inteleaved Code Resolution (mm)	**0.38**	14	16	18	20	22	24
	0.50	18	19	21	23	25	27
	0.60	21	22	24	26	28	30
	1.00	34	35	36	37	39	41

Table 1

Minimum Code Height for Omnidirectional Reading (mm)							
Conveyor Speed (m/s)		**0.5**	**1**	**1.5**	**2**	**2.5**	**3**
Code 39 Code Resolution (mm)	**0.38**	12	13	15	17	19	21
	0.50	15	16	17	19	21	24
	0.60	18	19	20	21	23	26
	1.00	28	29	30	31	32	34

Table 2

Minimum Code Height for Omnidirectional Reading (mm)							
Conveyor Speed (m/s)		**0.5**	**1**	**1.5**	**2**	**2.5**	**3**
Code 128 – Ean 128 Code Resolution (mm)	**0.38**	10	12	14	16	18	20
	0.50	12	13	16	18	20	22
	0.60	14	15	17	19	21	24
	1.00	22	23	24	26	28	30

Table 3

Minimum Code Height for Omnidirectional Reading (mm)							
Conveyor Speed (m/s)		**0.5**	**1**	**1.5**	**2**	**2.5**	**3**
Codabar Code Resolution (mm)	**0.38**	16	18	20	22	24	26
	0.50	20	22	24	26	28	30
	0.60	23	25	27	29	31	34
	1.00	36	38	40	42	44	47

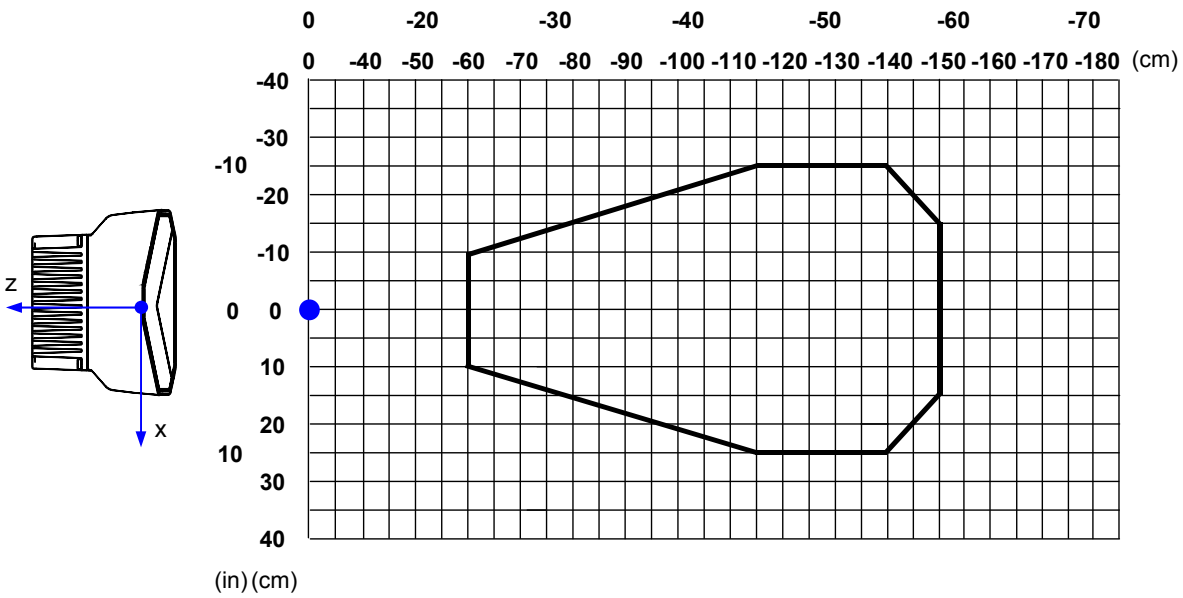
Table 4

Minimum Code Height for Omnidirectional Reading (mm)							
Conveyor Speed (m/s)		**0.5**	**1**	**1.5**	**2**	**2.5**	**3**
EAN 8-13, UPC-A Code Resolution (mm)	**0.38**	11	12	13	15	17	19
	0.50	13	14	15	16	18	20
	0.60	15	16	17	18	19	22
	1.00	24	25	26	27	28	29

Table 5

READING DIAGRAMS

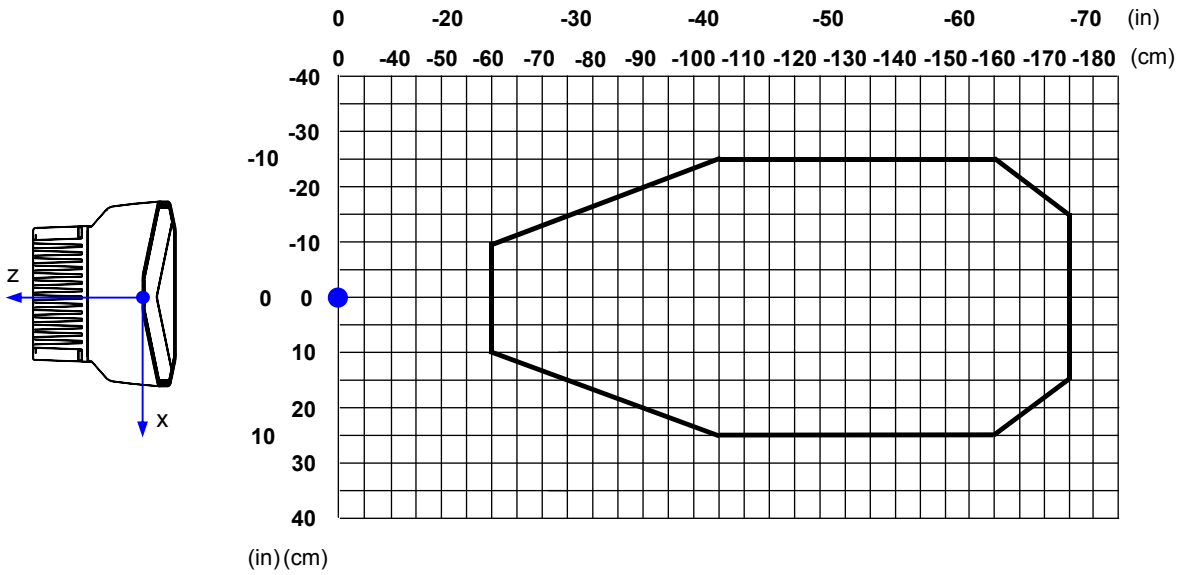
DX6400-100-0XX – Resolution: 0.38 mm/15 mils



Note: x = 0 and z = 0 correspond to the edge of the DX6400 scanner as shown in the figure above.

CONDITIONS
Code = Interleaved 2/5 or Code 39
PCS = 0.90

DX6400-100-0XX – Resolution: 0.50 mm/20 mils



Note: x = 0 and z = 0 correspond to the edge of the DX6400 scanner as shown in the figure above.

CONDITIONS
Code = Interleaved 2/5 or Code 39
PCS = 0.90

COMPLIANCE

See the DX6400 Reference Manual for the Declaration of Conformity.

LASER SAFETY

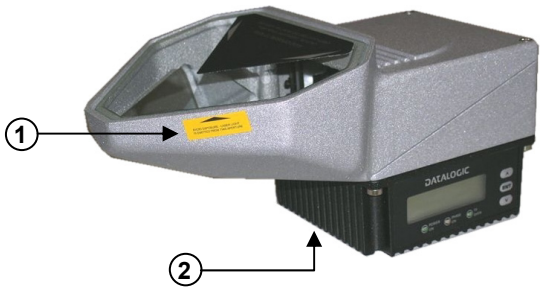


Figure A

1 Laser Safety Label

2 Identification Label

Figure B

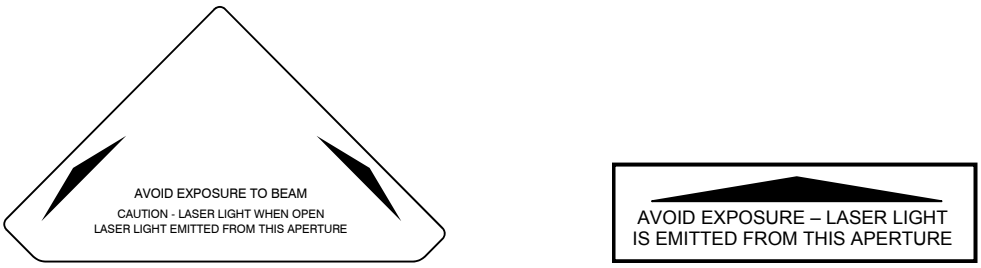
1 Warning and Device Class Label

The scanner is classified as a Class 2 laser product according to EN 60825-1 regulations and as a Class II laser product according to CDRH regulations.

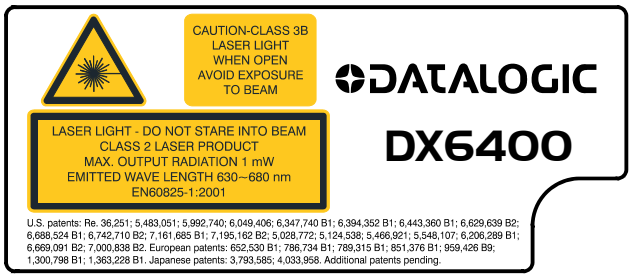
Disconnect the power supply when opening the device during maintenance or installation to avoid exposure to hazardous laser light.

There is a safety device which allows the laser to be switched on only if the motor is rotating above the threshold for its correct scanning speed.

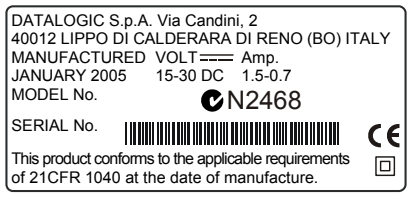
The laser beam can be switched off through a software command (see also the Genius™ Help On-Line).


AVOID EXPOSURE TO BEAM
CAUTION - LASER LIGHT WHEN OPEN
LASER LIGHT EMITTED FROM THIS APERTURE
AVOID EXPOSURE – LASER LIGHT
IS EMITTED FROM THIS APERTURE

Laser Safety Labels



Warning and Device Class Label


DATALOGIC S.p.A. Via Candini, 2
40012 LIPPO DI CALDERARA DI RENO (BO) ITALY
MANUFACTURED VOLT ⎓ Amp.
JANUARY 2005 15-30 DC 1.5-0.7
MODEL No.
N2468
SERIAL No.
This product conforms to the applicable requirements
of 21CFR 1040 at the date of manufacture.

Device Identification Label

The laser diode used in this device is classified as a Class 3B laser product according to EN 60825-1 regulations and as a Class IIIb laser product according to CDRH regulations. Any violation of the optic parts in particular can cause radiation up to the maximum level of the laser diode (35 mW at 630 ~ 680 nm).

POWER SUPPLY

This product is intended to be installed by Qualified Personnel only.

- **All DX6400 Models:**

  This device is intended to be supplied by a UL Listed Power Unit marked “Class 2” or LPS power source which supplies power directly to the scanner via the 25/26-pin connector.

CE COMPLIANCE

Warning:
This is a Class A product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

FCC COMPLIANCE

Modifications or changes to this equipment without the expressed written approval of Datalogic could void the authority to use the equipment.

This device complies with PART 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference which may cause undesired operation.

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

PATENTS

This product is covered by one or more of the following patents.

U.S. patents: Re. 36,251; 5,483,051; 5,992,740; 6,049,406; 6,347,740 B1; 6,394,352 B1; 6,443,360 B1; 6,629,639 B2; 6,688,524 B1; 6,742,710 B2; 7,161,685 B1; 7,195,162 B2; 5,028,772; 5,124,538; 5,466,921; 5,548,107; 6,206,289 B1; 6,669,091 B2; 7,000,838 B2.

European patents: 652,530 B1; 786,734 B1; 789,315 B1; 851,376 B1; 959,426 B9; 1,096,416 B1; 1,300,798 B1;1,217,571 B1; 1,363,228 B1; 1.607,901 B1.

Japanese patents: 3,793,585; 4,033,958; 4,129,302; 4,376,353.

Additional patents pending.